

REMARKS

Claims 1 and 12 are amended. No new subject matter is added. Claims 1 and 4-13 remain pending. Reconsideration and allowance of the pending claims is respectfully requested in light of the following remarks.

Applicant's Record of Substance of Interview under MPEP 713.04

In the final Office Action mailed on June 10, 2003, claims 1 and 12 were rejected under 35 USC § 112, first paragraph, as containing new matter. Specifically, the recited feature of “implanting impurity ions into the first and second active regions prior to formation of the tunnel oxide layer and the gate oxide layer” was considered new matter, even though this feature was recited in claim 3 of the original application.

A telephonic interview was conducted on November 13, 2003, between Examiner David Vu and Attorney Todd J. Iverson. The rejection of claims 1 and 12 under 35 USC § 112, first paragraph (new matter) was discussed. No exhibit was shown nor was the prior art specifically discussed.

It was pointed out that under MPEP 608.04, the recited feature of claims 1 and 12 that had previously appeared in original claim 3 is not new matter. Examiner Vu agreed and withdrew the rejection of these claims under 35 USC § 112, first paragraph.

However, the rejection of the claims under 35 USC § 102 was maintained.

Claim Rejections – 35 USC § 102(b)

Claims 1, 4-7, and 11-12 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,017,979 to Fujii et al. (hereafter, ‘Fujii’). The applicant disagrees.

Claims 1 and 12 recite, *inter alia*, forming a device isolation layer, forming a floating gate pattern, forming a gate conductive layer, forming a tunnel oxide layer, and forming a gate oxide layer. The Examiner has apparently attributed, in section 2 of the Office Action, a single structure described in Fujii to different structures recited in claims 1 and 12. In other words, the device isolation layer, the tunnel oxide layer, and the gate oxide layer are all allegedly disclosed by Fujii’s layer 17.

The above interpretation, however, is inconsistent with the applicant’s specification. Pending claims must be interpreted in a manner that is consistent with the specification (MPEP 2111). The specification (FIG. 8A; page 7, lines 5-17) clearly teaches that the device isolation layer is a structure that is separate and distinct from the tunnel oxide layer and the gate oxide layer. This distinction is also implicit in claims 1 and 12 themselves.

Consequently, Fujii’s element 17 does not disclose a device isolation layer that is separate and distinct from the tunnel oxide layer and the gate oxide layer.

Claims 1 and 12 are also amended to recite, *inter alia*, ***prior to formation of the tunnel oxide layer and the gate oxide layer***, implanting impurity ions into the first and second active regions to form a well and to adjust a threshold voltage of a MOS transistor (emphasis added). These amendments are fully supported by claim 3 of the original application and the specification at page 6, lines 23-24.

Fujii discloses, contrary to this limitation, that ions are implanted into the semiconductor substrate 11 ***when the floating gate 181 is formed*** from the second polysilicon film 18 (the alleged gate oxide layer) (FIG. 1E; column 4, lines 18-36; emphasis added). Thus, ions are implanted ***at the same time*** the floating gate 181 is formed (emphasis added). Fujii's thermal oxide film 17 (the alleged tunnel oxide layer) is formed ***before*** the floating gate 181 (FIG. 1C; column 4, lines 1-29; emphasis added). For this reason, Fujii does not disclose the feature of implanting impurity ions prior to formation of the tunnel oxide layer and the gate oxide layer.

Consequently, according to MPEP 2131, claims 1 and 12 are not anticipated by Fujii because Fujii fails to teach the feature of implanting impurity ions into the first and the second active regions prior to formation of the gate oxide layer and the tunnel oxide layer.

Claims 4-7 and 11 inherently contain the features of claim 1. Thus, under MPEP 2131, Fujii fails to anticipate claims 4-7 and 11 because it does not teach each and every element of claims 4-7 and 11.

Claims 1, 4-6, and 9-13 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,188,976 to Kume et al. (hereafter, 'Kume'). The applicant disagrees.

Claims 1 and 12 recite, *inter alia*, the feature of "***prior to formation of the tunnel oxide layer and the gate oxide layer***, implanting impurity ions into the first and second active regions" (emphasis added). It is alleged in the Office Action, section 3, that Kume implants impurity ions prior to formation of the gate oxide film 4. This is incorrect, for the following reason.

The gate oxide film 4 first appears in Kume FIG. 3A. Subsequent elements are formed in FIGS. 3B-3E. Kume explicitly states that source/drain regions are formed ***after*** the structure of FIG. 3E is achieved (column 7, lines 30-40; emphasis added). Please see column 7, lines 39-40, where Kume teaches "***Thereafter***, the manufacturing process proceeds to a normal process of forming a source/drain area" (emphasis added). Those skilled in the art realize that implanting impurity ions is part of the process of forming a source/drain area.

Consequently, under MPEP 2131, Kume fails to anticipate claims 1 and 12 because Kume does not teach the feature of implanting impurity ions prior to formation of the gate oxide layer and tunnel oxide layer.

Claims 4-6 and 9-13 inherently contain the features of either claim 1 or claim 12. Thus, Kume does not teach each and every element of claims 4-6 and 9-13 so it fails to anticipate these claims as well (MPEP 2131).

Claims 1, 4-6, and 8-13 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent Publication No. 2002/0008278 A1 attributed to Mori ('Mori'). The applicant disagrees.

Claims 1 and 12 recite, *inter alia*, a method comprising "prior to formation of the tunnel oxide layer and the gate oxide layer, implanting impurity ions into the first and second active regions."

Contrary to the recited limitation, Mori explains in [1024], first sentence, that "a tunnel oxide film 21a is *first* made as a gate insulating film" (emphasis added). Then, in [1024], fifth sentence, Mori teaches that "thermal oxidation is conducted to form a gate oxide film 21b necessary for a high-voltage circuit in the peripheral circuit region." Finally, in the last sentence of [1024] – "*Thereafter, ion implantation is conducted* in the peripheral circuit region for controlling the channel impurity concentration" (emphasis added).

Consequently, under MPEP 2131, claims 1 and 12 are not anticipated by Mori because Mori fails to teach the recited feature of implanting impurity ions prior to formation of the gate oxide layer and tunnel oxide layer.

Claims 4-6, 8-11, and 13 inherently contain the features of either claim 1 or claim 12. Consequently, according to MPEP 2131, these claims are not anticipated by Mori because Mori fails to teach each and every element inherent to the claims.

Conclusion

For the foregoing reasons, reconsideration and allowance of claims 1 and 4-13 of the application as amended is solicited. The Examiner is encouraged to telephone the undersigned at (503) 222-3613 if it appears that an interview would be helpful in advancing the case.

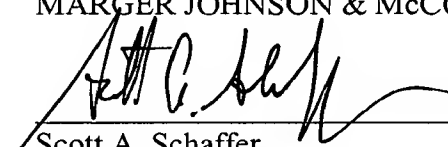
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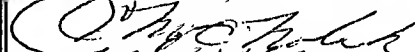
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